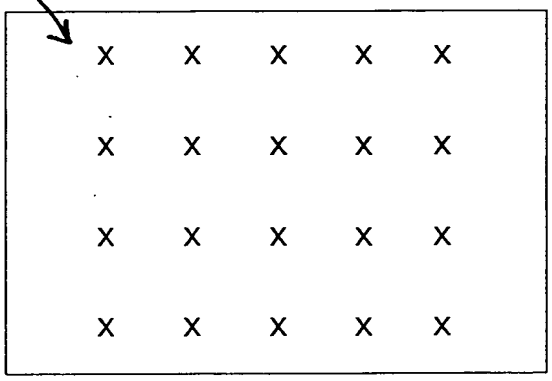
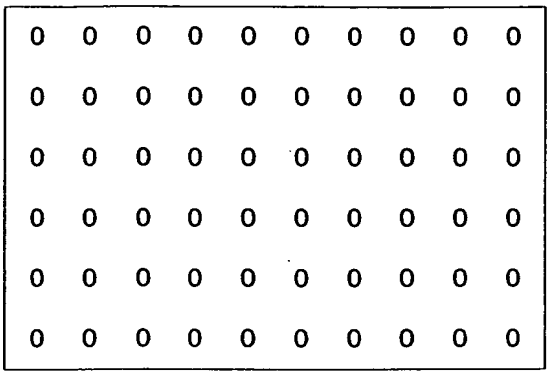
10



Source Image (Is)
Dimension 5x4
points (pixels)
Aspect Ratio 5/3
Anamorphic
Pixels



Destination
Image (Id)
Dimension 10x6
points(pixels)
Aspect Ratio 5/3
Square Pixels

Fig. 1

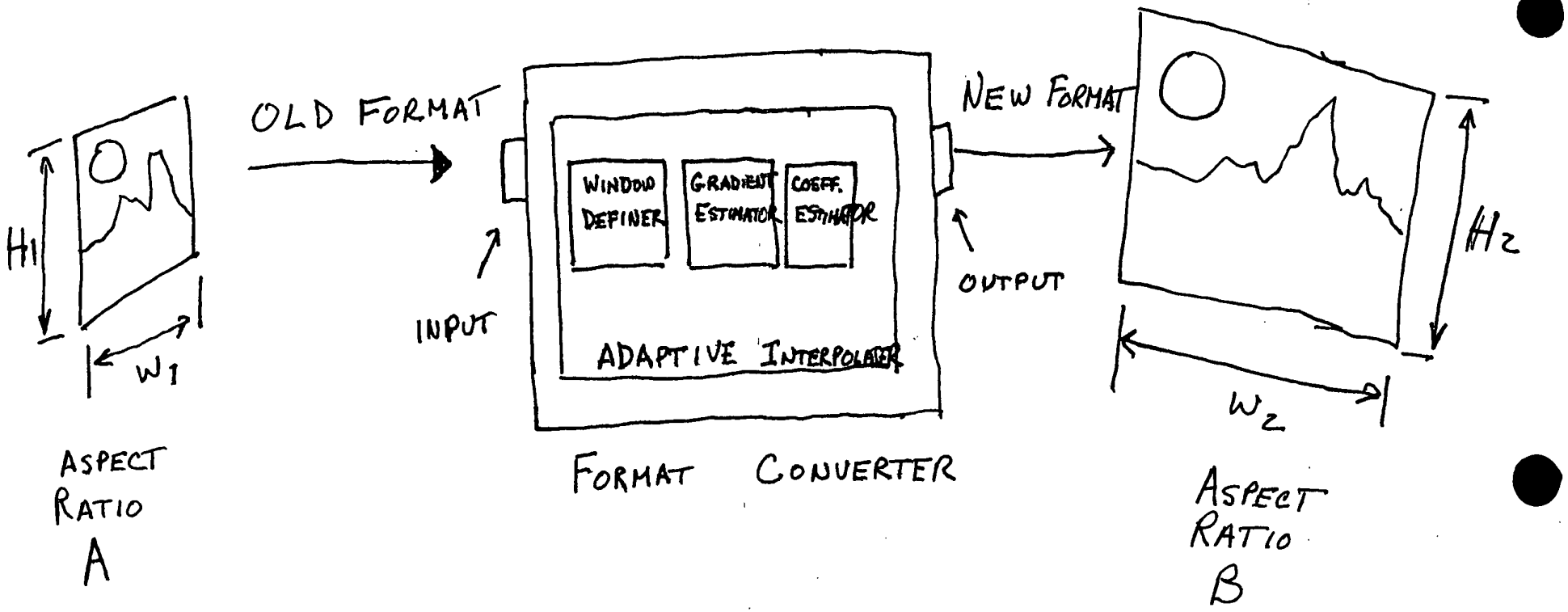


FIG. 2

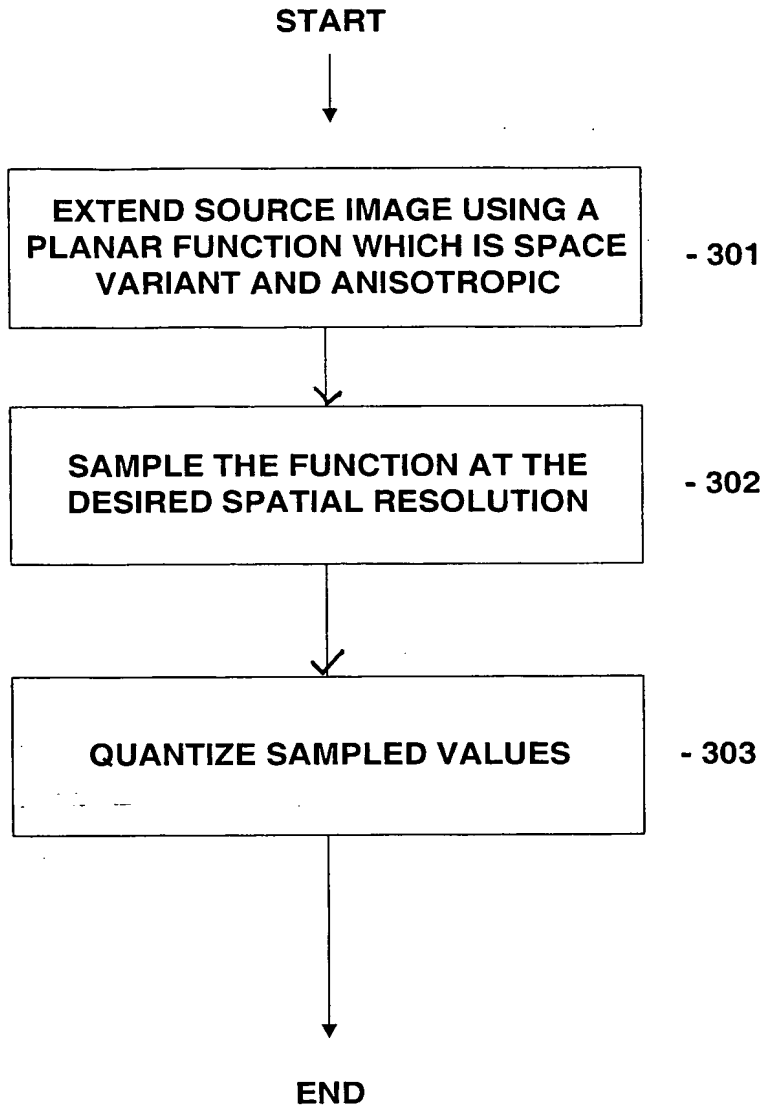

START
EXTEND SOURCE IMAGE USING A PLANAR FUNCTION WHICH IS SPACE VARIANT AND ANISOTROPIC
- 301
SAMPLE THE FUNCTION AT THE DESIRED SPATIAL RESOLUTION
- 302
QUANTIZE SAMPLED VALUES
- 303
END

FIG. 3

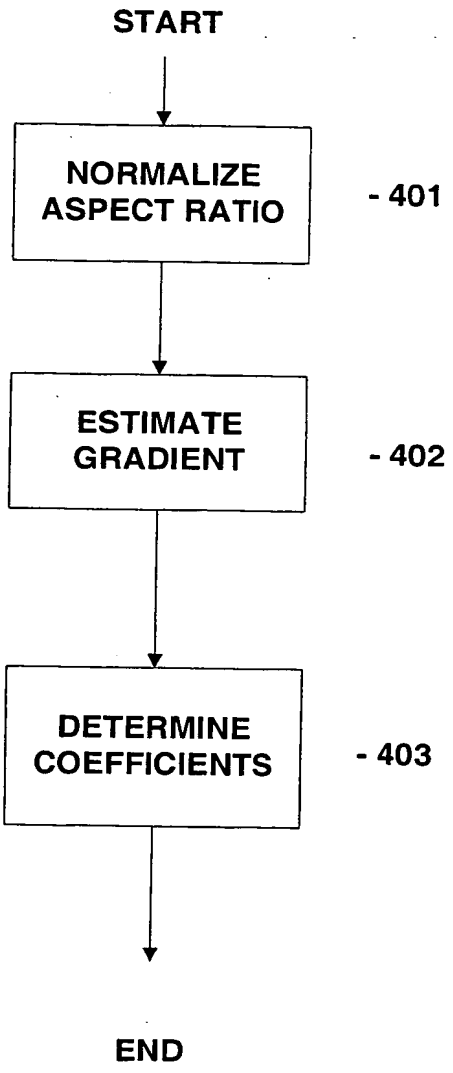

START
NORMALIZE ASPECT RATIO
- 401
ESTIMATE GRADIENT
- 402
DETERMINE COEFFICIENTS
- 403
END

FIG. 4

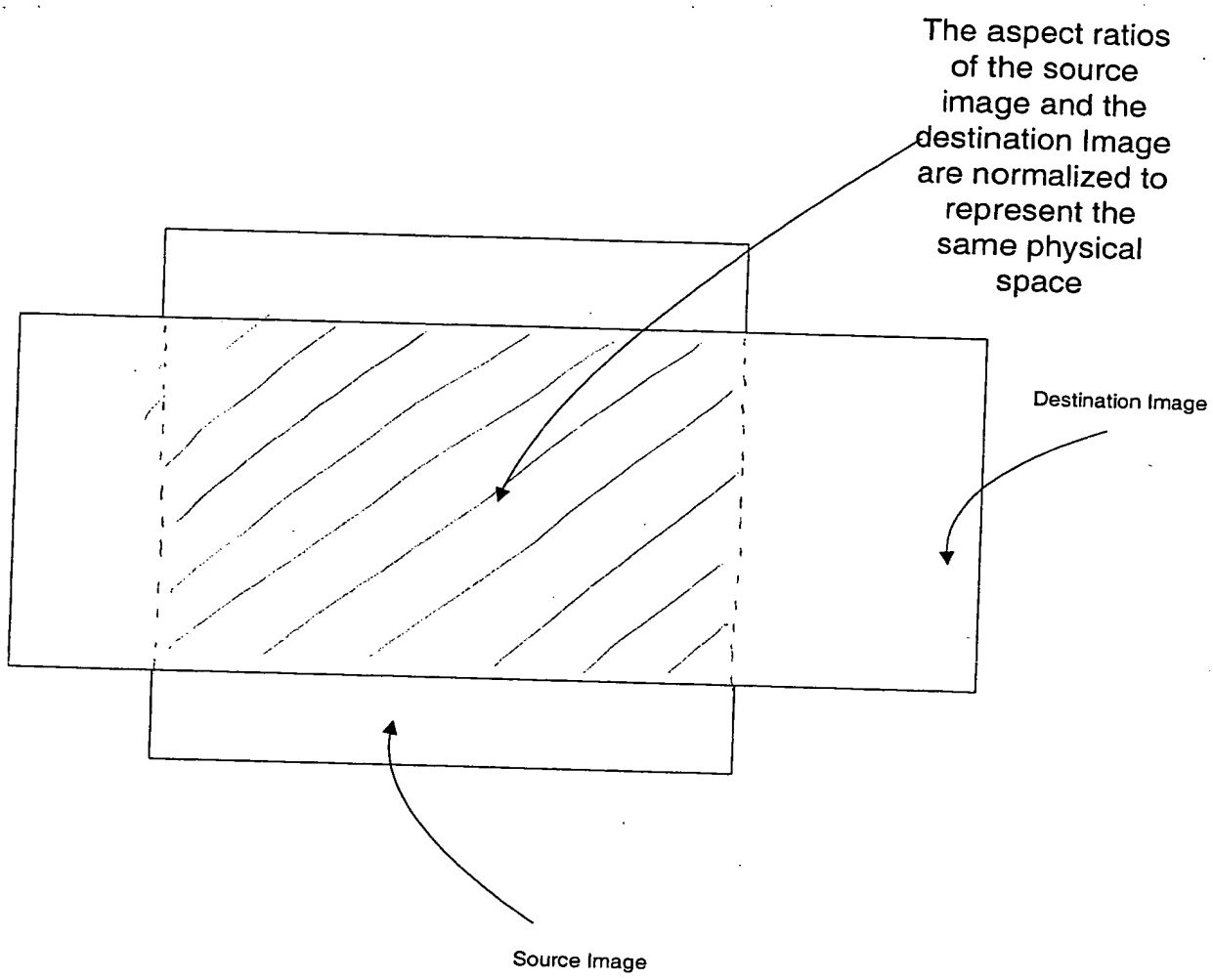

The aspect ratios of the source image and the destination Image are normalized to represent the same physical space
Destination Image
Source Image

Fig. 4A

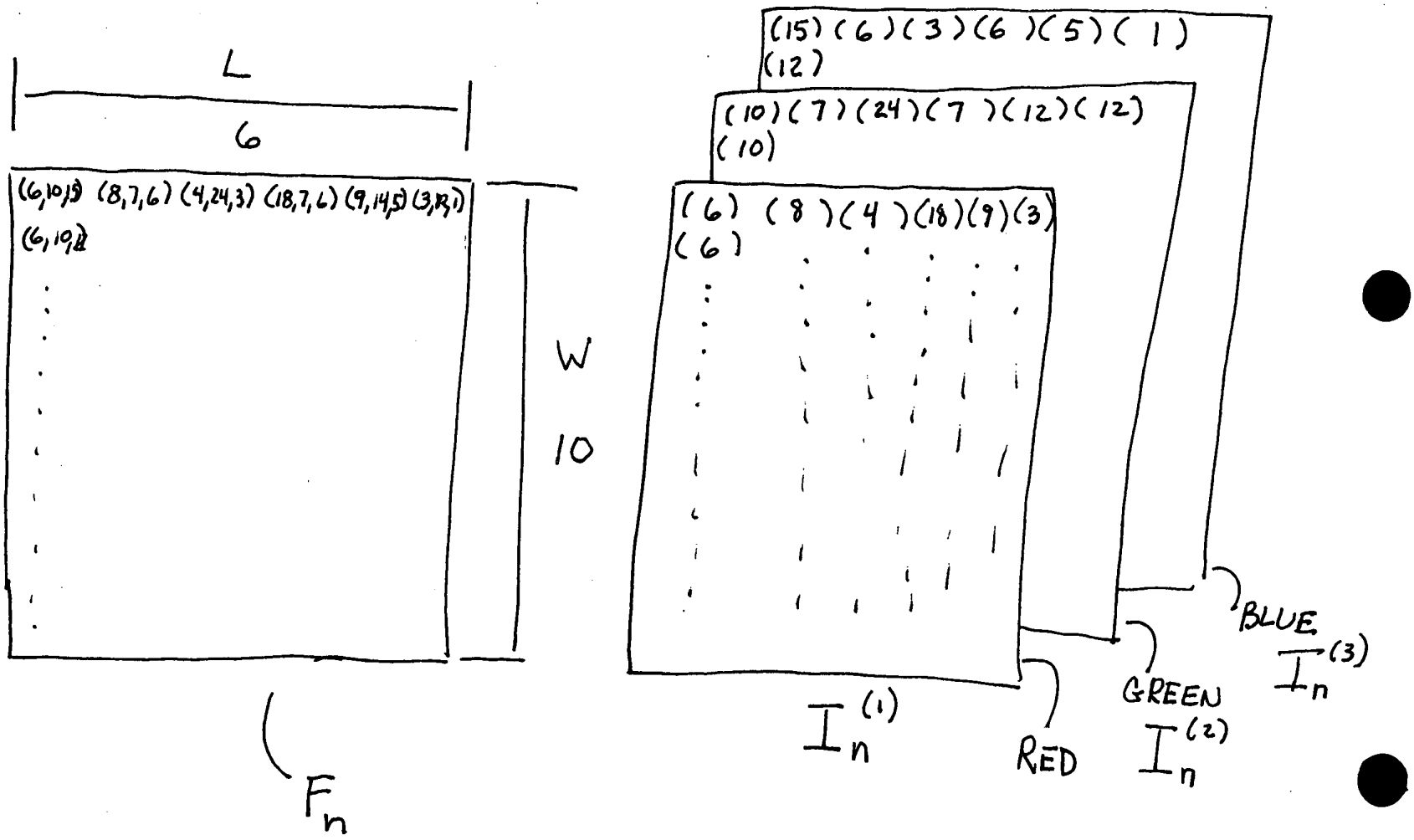

L
6
W
10
(6,10,9) (8,7,6) (4,24,3) (18,7,6) (9,14,5) (3,12,1)
(6,10,12)
F_n
(15) (6) (3) (6) (5) (1)
(12)
(10) (7) (24) (7) (12) (12)
(10)
(6) (8) (4) (18) (9) (3)
(6)
$I_n^{(1)}$
RED
$I_n^{(2)}$
GREEN
$I_n^{(3)}$
BLUE

FIG. 5

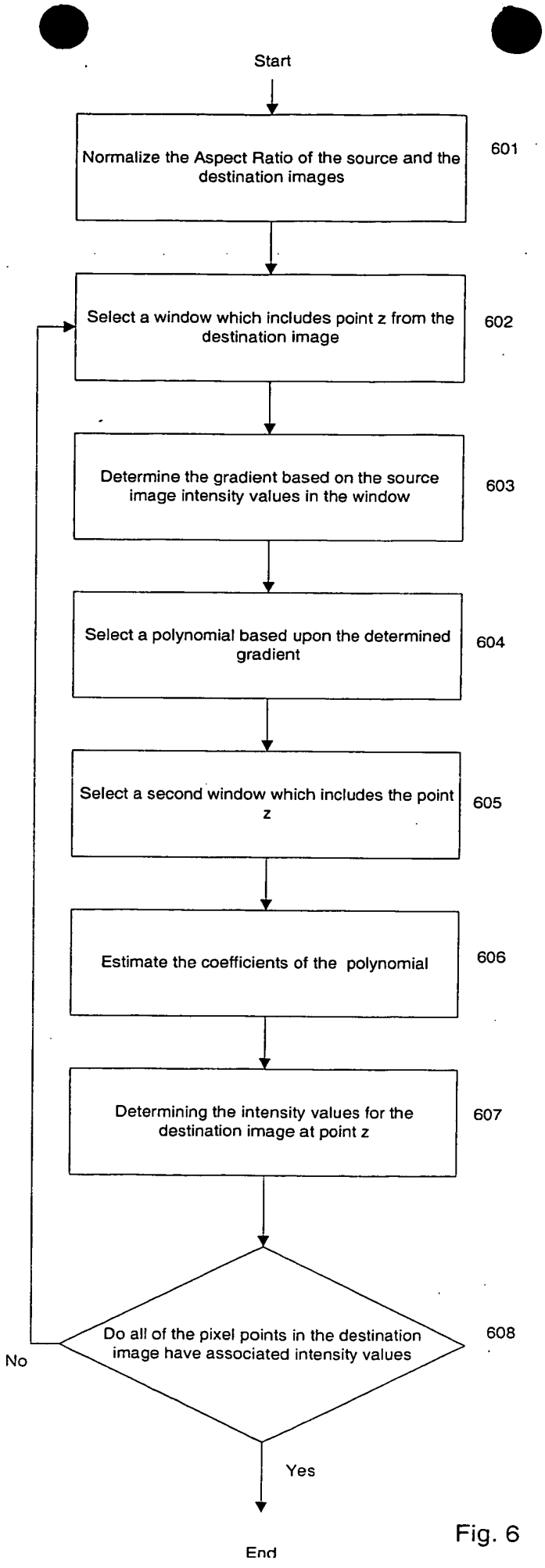
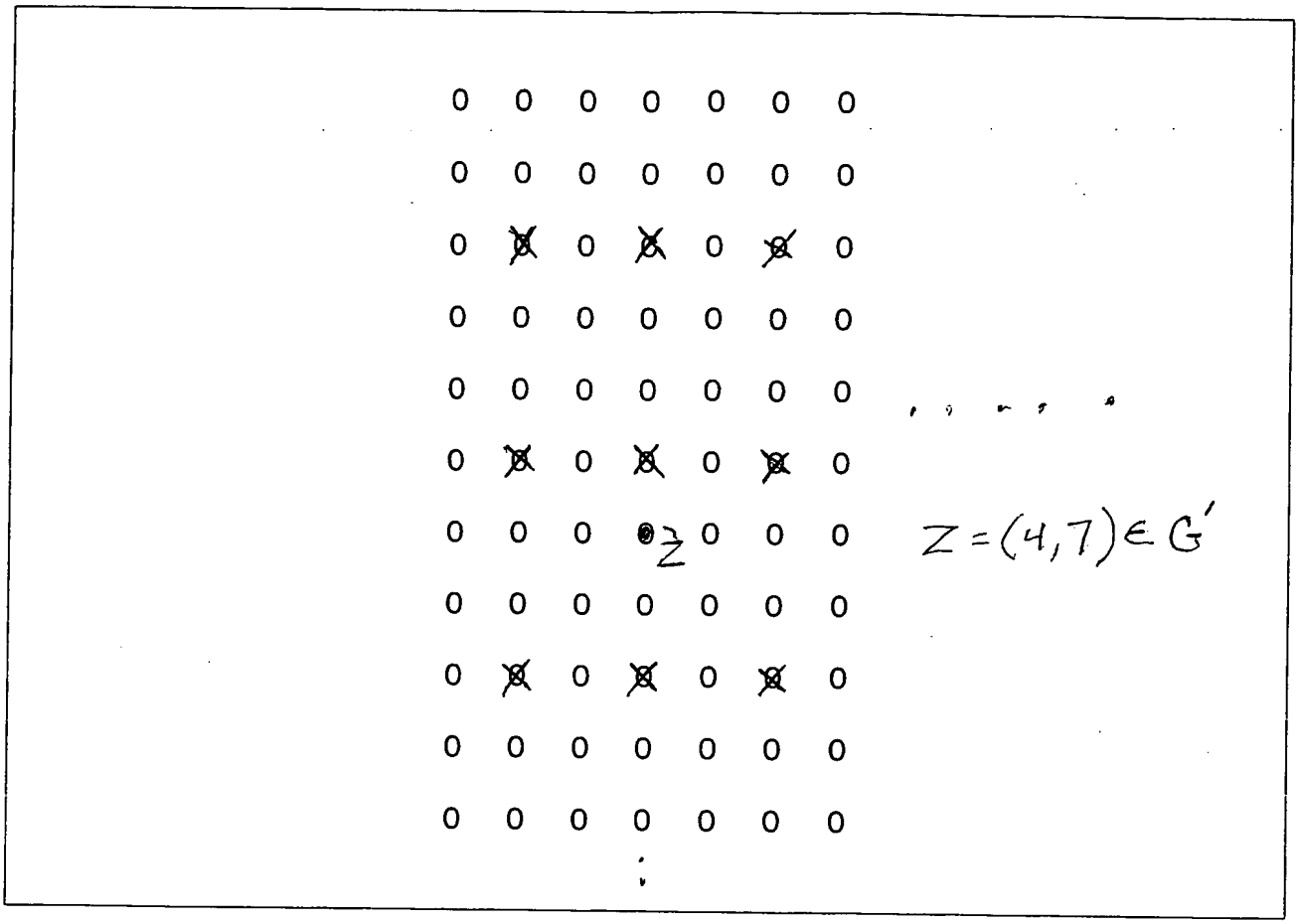

Start
Normalize the Aspect Ratio of the source and the destination images
601
Select a window which includes point z from the destination image
602
Determine the gradient based on the source image intensity values in the window
603
Select a polynomial based upon the determined gradient
604
Select a second window which includes the point z
605
Estimate the coefficients of the polynomial
606
Determining the intensity values for the destination image at point z
607
Do all of the pixel points in the destination image have associated intensity values
608
No
Yes
End

Fig. 6



G: The Points(Pixels) of the Source Image is Represented by X's

G': The Points(Pixels) of the Destination Image is Represented by 0's

Fig. 7

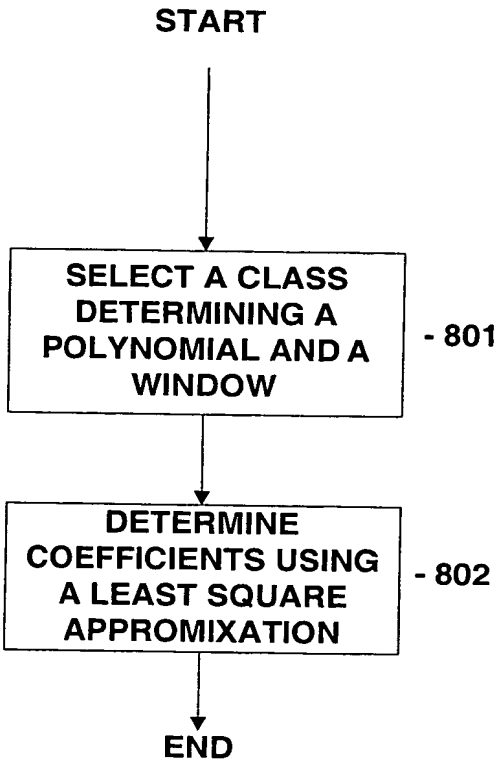

START
SELECT A CLASS DETERMINING A POLYNOMIAL AND A WINDOW
- 801
DETERMINE COEFFICIENTS USING A LEAST SQUARE APPROMIXATION
- 802
END

FIG. 8

GRADIENT		CLASS	POLYNOMIAL	WINDOW SIZE
MAGNITUDE	DIRECTION			
1	1	1	$A+Bx$	2
1	2	2		
1	3	3		
1	4	4		
2	1	5		
2	2	6		
		16	$A+Bx+Cy+Dxy$	4

FIG. 9

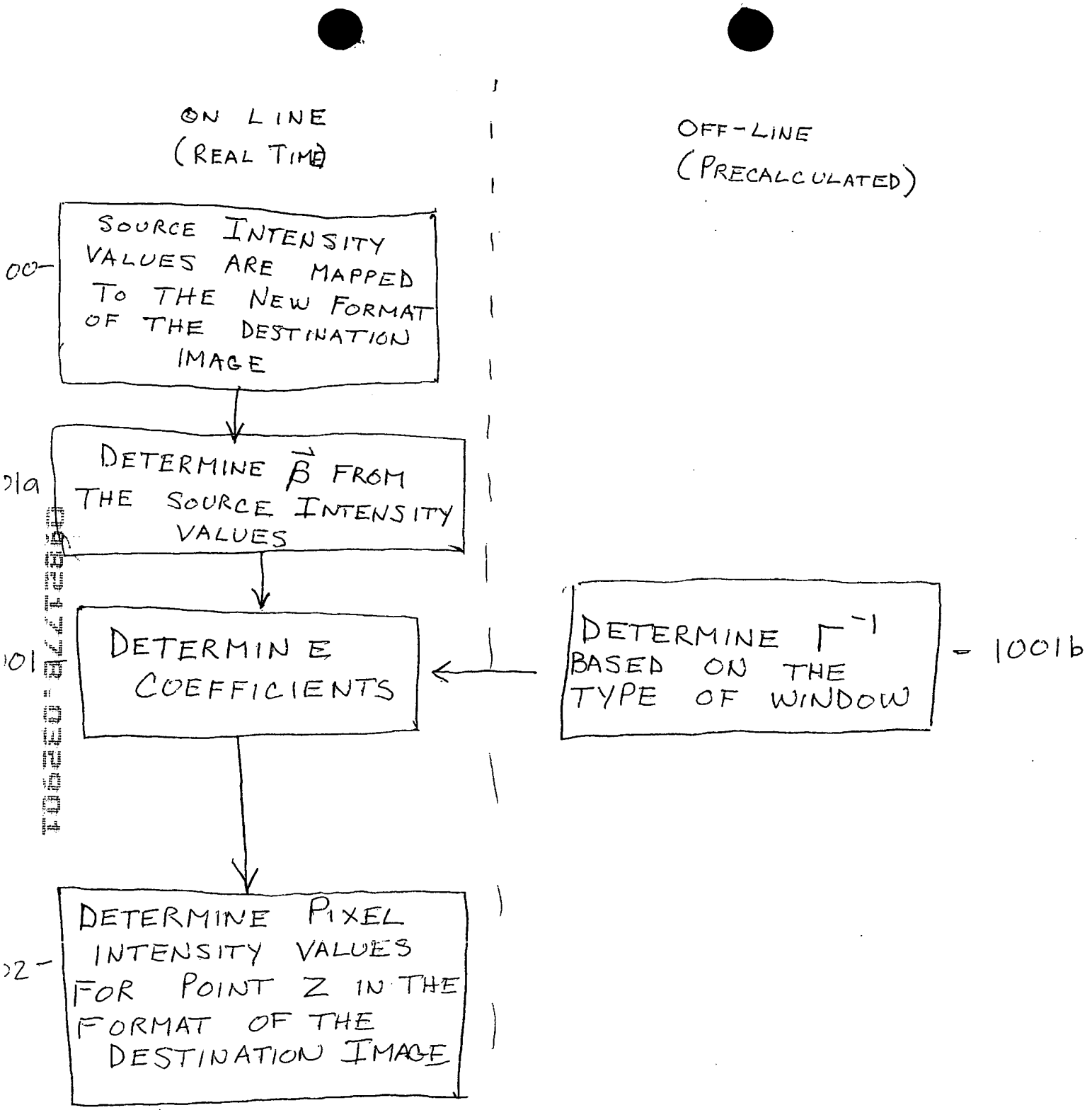

ON LINE
(REAL TIME)
OFF-LINE
(PRECALCULATED)
SOURCE INTENSITY VALUES ARE MAPPED TO THE NEW FORMAT OF THE DESTINATION IMAGE
1000
DETERMINE $\vec{\beta}$ FROM THE SOURCE INTENSITY VALUES
1010
DETERMINE COEFFICIENTS
DETERMINE Γ^{-1} BASED ON THE TYPE OF WINDOW
1001b
DETERMINE PIXEL INTENSITY VALUES FOR POINT Z IN THE FORMAT OF THE DESTINATION IMAGE
1020

FIG. 10

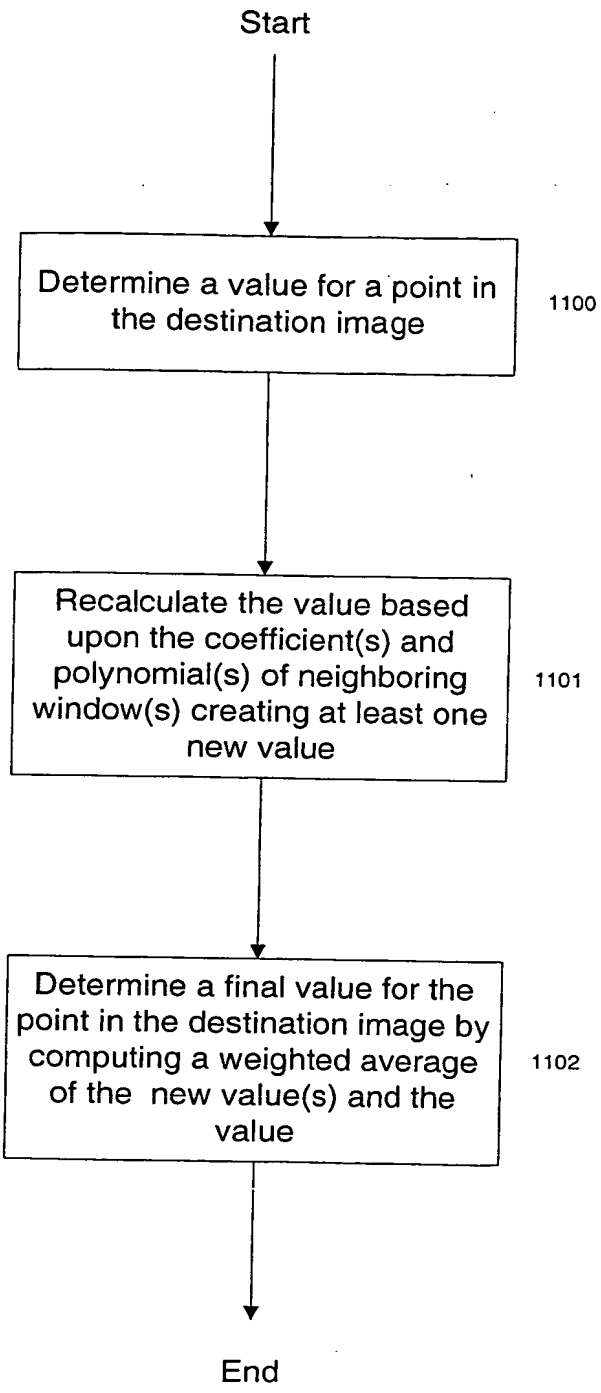

Start
Determine a value for a point in the destination image
1100
Recalculate the value based upon the coefficient(s) and polynomial(s) of neighboring window(s) creating at least one new value
1101
Determine a final value for the point in the destination image by computing a weighted average of the new value(s) and the value
1102
End

Fig. 11